

# RAJASTHAN UNIVERSITY LIBRARY

## DATE LABEL

Call No. F5594.9h11 (B.C)  
D2

Date of Release  
for loan

Accn. No. 80809

This book should be returned to the library on or  
before the date last stamped below.


Indian Explosives Act (IV of 1884)

---

THIRD ANNUAL REPORT

OF THE

CHIEF INSPECTOR OF EXPLOSIVES,  
INDIA,

BEING HIS

FOR THE

*Year ending 31st March 1902.*



SIMLA:

PRINTED AT THE GOVERNMENT CENTRAL PRINTING OFFICE.

1902.

9. Fireworks (12 accidents) have been responsible for 12 deaths and injuries to 18 persons. It will be seen from Appendix B that in practically all the cases the fireworks were crackers or bombs, made of Chlorate of Potash and Sulphide of Arsenic, which are really somewhat formidable explosives and very sensitive. I have already recommended their prohibition, and the question is still under the consideration of the Government of India, but will probably be settled shortly, as the results of the tests of the different classes of fireworks in India, ordered to be carried out with a view to ascertaining their composition, have now been received. The Sulphur Chlorate combination appears to be fairly prevalent.

# Third Annual Report of the Chief Inspector of Explosives in India.

No. 335.

FROM

MAJOR C. A. MUSPRATT-WILLIAMS, R.A.,  
*Chief Inspector of Explosives,*

TO

THE SECRETARY TO THE GOVERNMENT OF INDIA,  
HOME DEPARTMENT.

*Simla, the 8th May 1902.*

SIR,

I have the honour to submit herewith a report of the work of my Department  
for the year ending the 31st March 1902.  
Introductory.

---

5. The physical condition of all the explosives in the different magazines was found to be good, with the exception of about 65 lbs. of dynamite in the magazine of the Indian Midland Railway at Bina, to which water must have had access, as the cartridges and wrappers were damp and had free nitro-glycerine on them. At my recommendation this dynamite was destroyed. None of the samples of explosives, taken at inspections, failed to pass the necessary tests, which were carried out by the Chemical Examiners at Calcutta, Bombay, Madras and Rangoon, and the Testing Officer at Karachi.

6. No accidents have occurred in the magazines, or in the one factory licensed in this country. A list of other accidents by fire or explosion from explosives, inflammable substances, dangerous chemicals, etc., which have been brought to the notice of this Department between the 1st January 1901, and the 31st December 1901, are given in Appendix B, together with short details of each accident. It will be seen from a perusal of these accidents, that most of them have taken place through want of ordinary precautions. Last year there were 25 accidents causing 41 deaths, and injuries to 29 persons. This year there were 38 accidents, causing 45 deaths and injuries to 46 persons. One lamentable accident from petroleum was responsible for 17 of these deaths. (Accident No. 36.)

7. This year gunpowder (9 accidents) is only responsible for 8 persons killed, and 10 injured, as compared with 22 and 5 respectively from 5 accidents last year, in which year one accident alone, occurring on registered premises, was the cause of 13 deaths. In my last year's report I drew attention to the fact that I was afraid that the conditions of the licenses of these premises were not strictly enforced or observed, and that I proposed to inspect some of them and address Local Governments on the subject. Accordingly during the past cold weather I visited a number of these premises, and am about to submit a report to Local Governments pointing out how improvements can be effected.

10. In Appendix B is giving a detailed account of a very terrible accident (No. 36), which was started by an overflow of oil fuel due to the carelessness

Petroleum.

of a native pumpman. The method in vogue for gauging was very primitive, and consisted in the native pumpman putting in a rod to ascertain the height of the oil fuel, which he was not supposed to allow to rise within a certain distance of the top. This accident illustrates the travelling power of oil vapour. In the Appendix also will be seen the recommendations which I thought it necessary to make to the Government of Burma, to prevent similar accidents in the future.

There were three accidents due to Kerosine Oil, one causing the destruction of property worth about one lakh of rupees, and in connection with them I thought it advisable to write a letter (Appendix C) to Local Governments, pointing out certain dangers to be apprehended in the storage of Kerosine Oil, and recommending that officers appointed to visit premises licensed under the Petroleum Act should be instructed to insist that the Kerosine Oil stored on these premises is kept covered up, and not exposed in open tins or vessels. These accidents also serve to illustrate the unadvisability of night work with petroleum. If night work is carried on, only Incandescent Electric lamps or safety lamps should be used. This also is the only class of lamp which should ever be taken into holds of ships or other unventilated places where materials are stored which are likely to give off any vapour.

Chemicals.

11. There were four accidents caused by Chemicals, but none of them were of any great importance.

12. Only four Government accidents, of which details are given below, occurred between the 1st January 1901 and the 31st December 1901. Taking into

Government accidents.

consideration the amount of warlike stores that are manufactured in India, and the number of Laboratory operations that are carried out in Arsenals and elsewhere, I think it is a matter of congratulation that there should have been so few accidents, and an evidence of the care and precautions that must have been generally taken :—

(a) On the 12th January 1901, at the Small Arms Ammunition Factory, Kirkce, a native was slightly injured by the ignition of a Direct Action Fuze, during the operation of soldering. The accident was due to the over heating of a soldering iron, about which the man had been specially cautioned.

(b) A very serious and lamentable accident took place at Secunderabad on the 18th March 1901. A party of men belonging to a Garrison Company of the Artillery, were emptying 40 pounder and 6.3" Howitzer shell in a gunshed on tarpaulins. After about 2½ hours work, and when 164 shells had already been emptied safely, four of the Howitzer shells burst, with the result that seven men were killed and one injured. A Court of Enquiry was held, but no exact cause for the accident could be assigned, but there was sufficient evidence to show that the Regulations laid down were not strictly carried out, more especially as regards the place where the work was carried out.

Two causes seemed possible, (1) that a spark had been produced by the use of a copper rod inside the shell to loosen the powder that had become encrusted and ignited the explosive, and (2) that a spark had been caused by the presence of grit or a match in any gunpowder lying on the floor, and that this powder became ignited and involved the shells in the general explosion. The latter seems the most probable, taking into consideration the fact that one of the men who was not killed, and who was standing behind men who were killed, stated in his evidence that he saw a flash first near the spot where the shells were being emptied, and that it was immediately followed by an explosion, which knocked him over, and also that the presence of grit and fine dust in a gunshed is somewhat to be expected.

There are one or two points with regard to Laboratory Operations, which I think are worth mentioning here. Men engaged in this kind of work should

always take off their boots and put on shoes of felt or leather without any nails in them, or work in their socks, if these are not available. They should also remove their outer garments and put on special Laboratory clothes without any pockets in them. It has been found by experience in England that searching alone is not sufficient to eliminate the chance of matches and other foreign substances getting into danger buildings on the persons of employes, and that "no pockets" is the safest guarantee.

Another point is to always limit the number of men engaged in a danger area, and the amount of explosive in that area to the minimum consistent with practical working. Also where two or more danger areas exist, as for instance in the case of several parties of men carrying out Laboratory operations simultaneously, the danger areas should be so separated, or removed from one another, that no explosion in one can possibly communicate itself to the others.

(c) On the 22nd March 1901, at the Bombay Arsenal, a Store Sergeant and three native lascars received orders to break up a number of old obsolete dummy patterns of shells, rockets, etc. While they were operating on a Life Saving Rocket, which was marked "Dummy", an explosion took place, which caused the death of two lascars. As there were no "live" Life Saving Rockets in the Arsenal, there was no possibility of a live one being substituted by mistake for the dummy. This particular rocket had been on the pattern list of the Bombay Arsenal since the 1st April 1891, but as all records over 10 years old are destroyed, no evidence could be brought forward to show whence it had originally been received. A Court of Enquiry found that no blame could be attached to any one in the Bombay Arsenal.

(d) On the 1st May 1901, an accident, causing slight injuries to a Store Sergeant and two lascars, occurred at the Madras Arsenal. Orders were received in the Arsenal that certain obsolete patterns of rockets, etc., were to be examined carefully in a Laboratory, before being broken up with a view to ascertaining whether they were really dummies or not. These orders were probably the result of the Bombay Arsenal accident mentioned just above. When the rocket was unscrewed, material looking like fuze composition was found inside, and consequently the rocket was soaked in water for four or five hours. Some difficulty was then experienced in getting at the composition owing to the presence of two discs. The Conductor in charge ordered a Store Sergeant to hammer at the end of the rocket to try and loosen the discs. The Store Sergeant used a heavy hammer. After the third blow there was a slight explosion.

13. In my Annual Report last year I suggested that it would help to prevent robberies in magazines if increased facilities were given to small mine owners to obtain dynamite from large "Feeder" magazines, and recommended certain alterations in the permit system in vogue under the Arms Act for the transport of explosives. These recommendations have been accepted, and put in the form of a draft rule, and the Government of India have asked the Governments of Madras, Bombay and Bengal to get the opinion of the Mercantile community interested in the matter on the proposed rule.

I am of opinion that magazine owners would also help very considerably in the prevention of robberies, if they would all employ a good stamp of man, such as pensioners from the Native Army, to guard their magazines, more especially by night. Two men should be sufficient for the purpose. Magazines are always some distance off from other buildings, and their isolation, when unguarded, must certainly offer great temptation and opportunities to thieves.

14. 2,181,465 lbs. of explosives, or roughly about 1,090 tons, were imported by sea into British India in the year 1901, the value being Rs. 15,64,642.

Full details showing the different kinds of explosives imported, and the value of each, are given in Appendix D.

15. Some points of interest in connection with the work done by this Department during the year are given below :—

General Remarks.

- (a) The Rules issued by the Government of India for the transport and importation of Explosives have been revised and re-issued.  
Government of India transport and importation rules.
- (b) The rules for the port of Madras have been revised, finally settled, and issued.  
Madras port harbour rules.
- (c) It has been settled that Government explosives are exempt, under section 14 of the Explosives Act, from the rules for the importation, and transport of explosives at the various Indian ports.  
Government explosives.
- (d) Powers under the Arms Act have been given to the Chief Inspector and Inspector of Explosives, *vide* Appendix E.  
Arms Act.
- (e) This Department has drawn up instructions, *vide* Appendix F, to assist district officers in making enquiries in the case of explosions, which are not considered serious enough by Local Governments to require the presence of the Chief Inspector of Explosives, or the Inspector of Explosives. These instructions were circulated to Local Governments.  
Investigation of explosions.

(g) This Department has now arranged to keep a stock of all rules issued under the Explosives Act, and to supply them to the public on payment. Forms for the applications of licenses, etc., can also be obtained from this office.  
Sale of rules under the Explosives Act.

- (i) A rule regarding the packing of electric detonators has been added to the rules for the transport and importation of explosives, *vide* Government of India, Home Department, Notification, No. 158-Public, dated Calcutta, the 15th January 1902, see Appendix J.  
Electric detonators.
- (j) Carbide of Calcium rules have now been finally issued by the Governments of Madras, the Punjab, the United Provinces of Agra and Oudh, Burma, Assam, the Central Provinces and Coorg. Rules will also be issued very shortly by the Bengal and Bombay Governments.  
Carbide of Calcium rules.



- (k) The extension of the Petroleum Act to the whole of British India is now under consideration, *vide* Government of India, Home Department, Notification, No. 1704-Judicial, dated Calcutta, the 20th December 1901, see Appendix K.

- (l) The packing of Peroxide of Sodium has been referred to this Department. Peroxide of Sodium by itself is a perfectly stable body, not liable to spontaneous combustion, and not likely to explode by percussion, friction, heat, or by the addition of water, although in the latter case much heat is involved and steam produced. When, however, the peroxide is mixed with, or even simply in contact with any combustible substance, the access of water to the mixture causes an almost instantaneous outbreak of fire, or causes an explosion according to the greater or less intimacy of the mixture. Peroxide of Sodium should, therefore, always be packed in iron or steel drums sufficiently strong to stand rough usage without allowing any of the contents to escape, and not too large for ready handling. The drums should not be stored in any space containing combustible matter.

16. In conclusion I would draw attention to the fact that Honorary Captain Bartlett, Head Overseer, Gunpowder Factory, Ishapore, was appointed Inspector of Explosives with the Government of India, for a term of three years on probation, with effect from the 1st January 1900, so that his appointment will expire on the 31st December 1902, and it will therefore be necessary soon to deal with the question of his permanency. Captain Bartlett has been of the greatest assistance to me and has shown great energy and tact in the discharge of his duties.

C. A. MUSPRATT-WILLIAMS,  
Major, R. A.,  
Chief Inspector of Explosives.

# Appendix A.

## List of Magazines and Licenses granted under Rule 17 for the year 1901.

Province or Presidency.	District.	MAGAZINES.			LICENSES.		
		Under renewed license.	Under new license.	Total.	Renewed.	New.	Total.
Assam	Cachar	2	2	4	2	2	4
	Lakhimpur	1	...	1	1	...	1
	Total	3	2	5	3	2	5
Bengal	Bankura	...	1	1	...	1	1
	Burdwan	15	1	16	15	1	16
	Darjeeling	3	1	4	3	1	4
	Gaya	2	...	2	2	...	2
	Hazaribagh	8	1	9	8	1	9
	Hooghly	1	...	1	1	...	1
	Manbhum	9	1	10	9	1	10
	Midnapur	1	...	1	1	...	1
	Total	39	5	44	39	5	44
Bombay	Bombay	2	...	2	5	...	5
	Karachi	3	...	3	3	...	3
	Total	5	...	5	8	...	8
Burma	Mergui	1	...	1	1	...	1
	Ruby Mines	...	1	1	...	1	1
	Syriam	1	...	1	1	...	1
	Total	2	1	3	2	1	3
Central Provinces...	Bilaspur	1	...	1	1	...	1
	Raipur	3	...	3	6	...	6
	Saugor	1	...	1	1	...	1
	Total	5	...	5	8	...	8
Madras	Anantapur	2	...	2	2	...	2
	Coimbatore	1	...	1	1	...	1
	Godaveri	1	1	2	1	1	2
	Madras	5	...	5	5	...	5
	Nellore	2	...	2	2	...	2
	The Nilgiris	3	1	4	3	1	4
	Vizagapatam	2	...	2	2	...	2
	Total	16	2	18	16	2	18
United Provinces of Agra and Oudh.	Cawnpur	1	...	1	...	1	1
	Dehra Dun	1	...	1	1	...	1
	Lucknow	1	...	1	1	...	1
	Meerut	1	...	1	3	...	3
	Naini Tal	1	...	1	1	...	1
	Shahjehanpur	1	...	1	1	...	1
	Total	6	...	6	7	1	8
SUMMARY.							
Assam	...	3	2	5	3	2	5
Bengal	...	39	5	44	39	5	44
Bombay	...	5	...	5	8	...	8
Burma	...	2	1	3	2	1	3
Central Provinces	...	5	...	5	8	...	8
Madras	...	16	2	18	16	2	18
United Provinces of Agra and Oudh	...	6	...	6	7	1	8
GRAND TOTAL		76	10	86	83	11	94

Besides the magazines licensed in Bombay, there are 3 firework godowns licensed under Rule 17.  
At Karachi there is besides the three magazines licensed a Roburite Factory licensed under Rule 12.



## Appendix B.

*Accidents by fire or explosion which have been brought to the notice of the Explosives Department from 1st January 1901 to 31st December 1901.*

Number.	Date of accident.	Nature of Explosive.	Where accident occurred.	Circumstances of accident so far as ascertained.	NUMBER OF PERSONS.	
					Killed.	Injured.
EXPLOSIVES.						
1	5th February 1901 ...	Gunpowder ...	Odayakolam Village, Coimbatore, Madras.	A cooly was engaged in deepening a well by blasting with gunpowder. The charge went off before he got to a safe distance and he died from injuries caused by the explosion.	1	...
2	5th March 1901 ...	Ditto	Anaparay, Madras. Mile 33 of the Shoranur-Cochin Extension of the Madras Railway.	A cooly attempted to open an unfired hole, already charged with powder. An explosion took place, causing injuries to the man's eyes and right arm, which latter had to be amputated.	...	1
3	18th March 1901 ...	Ditto	District of Dera Ismail Khan.	Three Bhattanis, a frontier tribe, residing in Kiri Mir Azim, found a shell in the hills and proceeded to try and break it up with the result that it burst and injured them severely.	...	3
4	31st March 1901 ...	Blasting Gunpowder	Varadarajapuram in the Salem District.	One Adda Ram, whose profession was conducting blasting operations, was having some blasting gunpowder dried in front of his house and told a relative of his, a boy aged 10, to watch it. During the afternoon, the boy stirred up the gunpowder, which exploded and burnt him badly, and he died from the effects 12 days after.	1	...
5	30th May 1901 ...	Country Gunpowder	Vellalalayam	Two natives were preparing gunpowder for blasting by pounding in a mortar a mixture of sulphur, charcoal and saltpetre. The mixture suddenly ignited, badly burning both men. As it was found that this manufacture of gunpowder was being carried out without a license, steps have been taken to prosecute those concerned in the matter.	...	2
6	15th June 1901 ...	Gunpowder	Karuthanampatty digul, Madras.	A native was employed in blasting some rock at the bottom of a well. He charged the holes in the well, and after lighting the fuze, got to the top of the well. He was carrying a small quantity of powder in his hands, which got ignited by sparks, and he was so badly hurt that he died from the effects.	1	...
7	8th September 1901	Country Gunpowder	Thirumalanaickenppalayam, Coimbatore.	Two boys got hold of a bag containing a small quantity of gunpowder, put it on a tile, and set fire to it with the result that they were so burned that they died of their injuries.	2	...
8	2nd October 1901 ...	Gunpowder	Between Jhallar and Campbellpur.	A Sub Inspector, on the Railway was carrying gunpowder with a fuze in it in an open box on his trolley which had its lamps lighted. The box was under one of the lamps, and a man was also sitting near the box holding a hand-signal lamp. An explosion suddenly took place, burning two men severely and knocking every one off the trolley. A departmental enquiry was held, and the conclusion came to was that the accident was due to the man taking the lighted burner out of the hand signal lamp to clean the glass of the lamp and that the powder was ignited from the burner.	...	2
9	15th December 1901	Powder	Lyari Quarter, Karachi ...	A man was engaged in mixing gunpowder in a room in which were four other persons. It is believed that the powder exploded owing to the presence of grit. All five persons were severely burnt and three died from the effects.	3	2
Total					8	10
10	8th January 1901 ...	Dynamite	Nimtolla Ghat Street, Calcutta.	The Sub-Marine Defence Department were blowing up with dynamite an old iron pontoon, which was embedded in the river. Fragments of the pontoon struck three natives, who were from four to six hundred yards away, causing injuries, from which one died.	1	2
11	9th February 1901 ...	Ditto	Mahomedgunge, East Indian Railway Station.	Two natives were drilling in what remained of a former blast hole, and were injured by the explosion of a charge which had apparently remained unfired.	...	2

1st January 1901 to 31st December 1901—contd.

Number.	Date of accident.	Nature of Explosive.	Where accident occurred.	Circumstances of accident so far as ascertained.	NUMBER OF PERSONS.	
					Killed.	Injured.
			EXPLOSIVES—contd.			
12	15th April 1901	Dynamite	Salem, Madras	Blasting operations were being carried out by the Public Works Department on the Shevaroy Hills Ghaut Road. Before a blast was fired, the gangs of coolies at work were warned to clear out and to remove themselves to a distance. One of the coolies, however, was too lazy to do so and secreted himself in a hut with mat roofing at a distance of about 150 yards vertically and also horizontally from the place where the charges were fired, and a stone 9" x 9" x 9" fell through the roof and struck him on the head. He died from his injuries about 1½ hours after.	1	...
13	17th May 1901	Ditto	Mahomedgunge, East Indian Railway Station.	Two natives were drilling in what remained of a former blast hole, and were injured by the explosion of a charge, which had apparently remained unfired.	...	2
14	21st May 1901	Ditto	Vajrakarur, Madras	A number of coolies were drilling blast holes in proximity to some old holes, in one of which there happened to be part of a dynamite cartridge which had failed to explode. One of the drills came in contact with the cartridge which exploded and injured seven men, one of whom succumbed more from shock than any other cause. The injuries of the other six men were very slight.	1	6
15	6th June 1901	Ditto	Mile 42, Bhimchulha Cutting (Barum-Dalton-gunj Railway).	A boy was tampering with an unfired charge, when it exploded, seriously injuring both his hands.	...	1
16	26th July 1901	Ditto	Maladari, Coorg	A cooly was given some dynamite with fuze attached and told to light it, and then throw the package away in order to scare away a herd of elephants that had come near the cooly lines. An explosion occurred before the cooly threw the dynamite away, and his hand was shattered. The man, who gave the cooly the dynamite, was fined Rs. 40 by the District Magistrate for having dynamite in his possession without a license.	...	1
			TOTAL	...	3	14
17	25th February 1901	Fireworks "golas" consisting of chlorate of potash and sulphate of arsenic mixed with gravel and tied up with string in a cloth in the form of a ball.	Grahmapuri, Chanda, Central Provinces.	This explosion occurred on the registered premises of one Yusuf Ali Bohra. A magisterial enquiry was held and as far as could be ascertained the cause of the accident was believed to be due to the fact that Yusuf Ali went to a box containing "golas," and began hammering with an adze to open the box in order to supply "golas" to a boy who wanted to purchase them. The concussion exploded the bombs, and set the premises on fire, and also communicated explosion to a quantity of gunpowder which was also on the premises. Yusuf Ali, his wife and maid servant, the boy and two neighbouring shopkeepers were all killed, and nine other persons in the neighbourhood were injured, in most cases slightly.	6	9
18	8th March 1901	Fireworks consisting of sulphate of arsenic and chlorate of potash.	Panshcoorah, Midnapur...	A native was manufacturing fireworks, which were composed of sulphate of arsenic and chlorate of potash mixed with small stones, when an explosion took place, causing him injuries.	...	1
19	17th May 1901	Fireworks consisting of charcoal, sulphur, salt-petre and earth.	Parlakemedi, Ganjam	A slight explosion took place in a dwelling-house, but there was no loss of property or life. No cause of the explosion could be assigned. The owner of the house was prosecuted for keeping explosives in unlicensed premises.	...	...

*Accidents by fire or explosion which have been brought to the notice of the Explosives Department from  
1st January 1901 to 31st December 1901—contd.*

Number.	Date of accident.	Nature of Explosive.	Where accident occurred.	Circumstances of accident so far as ascertained.	NUMBER OF PERSONS.	
					Killed.	Injured.
EXPLOSIVES— <i>concl.</i>						
20	14th July 1901	Fireworks. Throw down crackers, made by mixing chlorate of potash and red sulphide of arsenic together and tying up the mixture and a small stone in a piece of cloth.	Egmore, Madras	A native was making throw down crackers in his house and, after making some, lit a cigarette and threw the match on the floor with the result that the composition for the crackers became ignited and the man, his wife and child were badly burned. The man succumbed to his injuries.	1	2
21	28th July 1901	Fireworks "crackers" consisting of red sulphide of arsenic and chlorate of potash.	Machooabazar Street, Calcutta.	A boy was carrying a basket of crackers, and managed to drop the basket, with the result that the crackers exploded and he was slightly injured.	...	1
22	31st July 1901	Fireworks called Sakkaravanam.	Tanjore	Fireworks were being manufactured on the registered premises of one Pakkiri, who had only a license to sell, when ignition took place, probably due to the fact that iron rods were being used in the manufacture. Some gunpowder in the room, and also in an adjoining room, caught fire and exploded, injuring a native woman so badly that she died shortly afterwards. As the licensee had only a license for the sale of fireworks and gunpowder, he had no business to carry on manufacture. He was consequently prosecuted and was convicted and sentenced to a fine of Rs. 50 and to undergo simple imprisonment for one month.	1	...
23	20th September 1901	Fireworks. Paper bombs of monchal which consists of arsenic, sulphur and chlorate of potash tied up with small stones.	Campbell Hospital, Calcutta.	A native boy was making a number of these paper bombs, when these already manufactured suddenly exploded. The boy sustained extensive burns with laceration of his left hand, which had to be amputated.	...	1
24	8th November 1901	Firework crackers made of chlorate of potash and sulphur.	155, Upper Chitpore Road, Calcutta.	A native was making some of these crackers when they suddenly exploded, causing injuries to both his legs, his right shoulder and cheek, from which, however, he recovered.	...	1
25	10th November 1901	Crackers made of chlorate of potash and sulphide of arsenic.	13, Banstolla Street, Calcutta.	A native was mixing the composition for making these crackers when it exploded causing him such injuries that he died from them.	1	...
26	13th November 1901	Country crackers consisting of a mixture of chlorate of potash and bisulphate of arsenic tied up with small stones and cloth in the form of small balls.	Bellary	Two boys were making these crackers, one of the boys was smoking a cigarette. A tin of composition was beside the boys, also a number of crackers which had been made. Suddenly an explosion occurred, probably caused by a spark from the cigarette and one boy was so badly injured that he died. The house was not licensed for manufacture, so the owner was prosecuted. About 100 of these crackers are made from a tola of powder and they are sold at the rate of 100 for an anna.	1	1
27	20th November 1901	Bomb crackers made of chlorate of potash and sulphide of arsenic.	Mullunga Lane, Calcutta	A native woman, tidying her room, dropped from her hands on to the ground a small tin of crackers which exploded and she was so badly hurt that she subsequently died from the injuries.	1	...
28	2nd December 1901	Fireworks probably composed of chlorate of potash and sulphide of arsenic.	Dharmavaram, Anantapur District, Madras.	An explosion occurred in a shop owing to some weights falling on a tin of fire works which was being kept for sale, with the result that one person was killed and two others badly injured. The composition was unknown, but there can be little doubt but that it was some mixture of chlorate of potash and sulphide of arsenic.	1	2
TOTAL					12	16

1st January 1901 to 31st December 1901—contd.

Number.	Date of accident.	Nature of Chemical.	Where accident occurred	Circumstances of accident so far as ascertained.	NUMBER OF PERSONS.	
					Killed.	Injured.
CHEMICALS.						
29	28th April 1901 ...	Nitric acid ...	Coimbatore ...	A case of nitric acid, which was being conveyed from Podanur to Mettupalayam, was found to be on fire at Coimbatore. The cause of the fire was reported to be due to the case having fallen on its side in transit. Only a small quantity of the acid was saved. No other damage was done.	...	...
30	21st May 1901 ...	Ammonia ...	Fyzabad ...	A general clerk on the railway was making ice cream in his quarters with an ice-cream freezing machine charged with liquor ammonia, when it burst causing him such injuries that he died an hour afterwards. Evidence states that the man knew nothing about the manipulation of the machine and put the wrong end in the fire.	1	...
31	9th July 1901 ...	Sulphuric acid ...	Calcutta ...	A cooly was rolling a drum of sulphuric acid from a shed preparatory to loading it on a railway wagon, when the drum burst, and the man was badly burnt by the acid.	...	1
32	31st October 1901...	Potassium chlorate ...	Amritsar ...	In the Amritsar station goods yard three casks of chlorate of potash were being rolled down a slope, when one of them struck against the bottom sliding rail of the goods shed gate, and became ignited. The cask was at once removed to a safe distance from the goods shed, and the fire extinguished. No other damage was done. Traces of sulphur were noticed on the end of one of the casks.	...	...
TOTAL					1	1
PETROLEUM.						
33	24th January 1901 ...	Crude oil ...	Syriam Refinery, Rangoon.	At 1 A.M. an explosion occurred at No. 1 Crude Oil Stock Tank, blowing off the top of the tank and setting the oil on fire. The fire was prevented from spreading to the other tanks and simply burnt away fiercely within the walls surrounding the tank. The cause of the accident was due to the fact of a lamp being brought into the neighbourhood of a leaky joint in a pipe leading from a flat, which had been discharging oil to the tank, and being overturned.  The oil on the ground got ignited and the vapour in the pipe must have got ignited and flashed to the tank, causing an explosion.	...	...
34	11th March 1901 ...	Kerosine oil ...	Lakhipur, Noakhali, Bengal.	A lighted kerosine lamp in one of the shops in the bazar fell into a tin full of kerosine oil, causing a conflagration which destroyed 135 houses and property to the value of about one lakh of rupees. No one was killed or injured.	...	...
35	18th March 1901 ...	Ditto.	Villupuram, Madras ...	A dealer in kerosine oil was pouring out kerosine oil from a tin, and was also holding a lamp in his hand. The oil caught fire and the man was so severely burnt that he died from the effects.	1	...

3

*Accidents by fire or explosion which have been brought to the notice of the Explosives Department from  
1st January 1901 to 31st December 1901—contd.*

Number.	Date of accident.	Nature of oil,	Where accident occurred.	Circumstances of accident so far as ascertained.	NUMBER OF PERSONS.	
					Killed.	Injured.
				PETROLEUM—contd.		
36	8th May 1901	Oil, fuel	At the Syriam Oil Works near Rangoon, belonging to the Burmah Oil Company.	<p>The explosion took place at 6-15 A. M., and was the cause of Mr. Shields' Assistant Chemist and 19 native employes getting so severely burnt that Mr. Shields and 16 natives succumbed to their injuries. The District Magistrate and the Inspector of Explosives, who happened to be in Rangoon at the time, both visited the scene of disaster, and held separate enquiries. Both came to the same conclusion, <i>viz.</i>, that the primary cause of the accident was due to an overflow from the oil fuel tank, due to the negligence of the pump man responsible for pumping up the oil fuel into the tank from the main reservoir. The oil fuel overflowing made its way to the heated brick work of the flues and it is surmised that it became volatilized and that the vapour was drawn in by the indraft, which exists round furnaces, to the boiler furnaces which were only 23 feet away, and was there ignited. There was evidence to show the presence of flame in the air before the explosion actually took place. Naturally, directly the vapour was ignited, it carried back the flame to the source whence it emanated, and an explosion took place and the whole place was in flames. All the refining stills caught fire and all the unfortunate employes in the neighbourhood were caught by the flames before they could escape. On receipt of the reports from Burmah, the Chief Inspector of Explosives made the following recommendations to the Local Government.—</p> <p>(1) That the fuel tank be removed much further away from the furnaces, as vapour is capable of carrying considerable distances, and also that this tank be surrounded with a moat or enclosure wall or a combination of both, sufficient to catch any possible overflow and prevent its escape.</p> <p>(2) That every tank used for the storage of inflammable oil should be furnished with a self-registering gauge and tell-tale and also with an automatic cut off, such as an overflow pipe six inches from the top. This overflow pipe should be larger in diameter than the supplying pipe and should lead back to the tank from which the oil is being pumped or to some tank arranged to receive overflow.</p> <p>(3) That all precautions should be taken to localise by means of enclosure walls and moats the outflow of oil so as to limit the zone of fire in case of accident. Corrugated iron screens would also be useful in limiting the range of flash.</p> <p>(4) That employes be clothed in incombustible clothing.</p>	17	3
37	14th October 1901	Kerosine oil	Khamgaon station yard, Great Indian Peninsula Railway.	<p>A travelling oil tank arrived by rail at this station about 1 P.M., and was handed over to the consignees to be emptied. The process of emptying the kerosine into cans commenced about 3 P.M. By about 10 or 10-30 P.M. 919 cans had been filled, and a man there got on the top of the truck with a lighted candle to see how much kerosine remained. Immediately there was a slight explosion, but luckily no one was injured.</p>	...	...



Number.	Date of accident.	Nature of oil.	Where accident occurred.	Circumstances of accident so far as ascertained.	NUMBER OF PERSONS.	
					Killed.	Injured.
				PETROLEUM-- <i>concl.</i>		
38	20th April 1901 ...	Oil ...	Akyab ...	<p>The British India Mail Steamer "Karagola" was discharging wooden barrels of oil at the Akyab wharf, when suddenly at about 1 P.M. she caught fire. She burnt till about 10-30 P.M., when she sank, having been scuttled. A court of enquiry was held and the following information elicited. About 110 barrels of oil had been discharged when flames and smoke were seen rising from the water and spread rapidly over the steamer and could not be overcome. The evidence taken showed that some of the barrels were in an extremely leaky condition, that the fire occurred about slack tide, and that a quantity of oil must have run down from the wharf and collected in the water and that probably this oil became ignited in some manner and was the cause of the mischief. The proceedings of the Court of Enquiry were sent to the Chief Inspector of Explosives for information who expressed the following opinions.</p> <p>A very dangerous state of things existed owing to the leakiness of the barrels and barrels in this state should never have been allowed on board the ship and this must be regarded as the primary cause of the accident. As there was oil leakage on the wharf, there must have been considerable leakage on and about the ship and in the hold. As the fire broke out about 1 P.M., the Sun's rays would then be very powerful and considerable volatilization of the escaped oil and consequent formation of vapour must have taken place and this vapour would be very easily kindled. Oil vapour has great travelling power and in this case it may have been ignited by some light or smoking on the ship at some distance from where the vapour originally started. The actual cause of this ignition must have been on or near the ship and not on the wharf, as otherwise the latter would certainly have taken fire. If the boiler furnaces on the ship were alight, it does not seem improbable that the vapour may have been ignited by them as then there would be an indraft of air about them. The fact of there being no explosion was due probably to an excess of air.</p>	3	
				TOTAL ...	21	3

*Summary of accidents during the year 1901.*

Kind of explosive or dangerous and inflammable substance.	ACCIDENTS CAUSING LOSS OF LIFE AND BODILY INJURY.			Accidents not causing loss of life or bodily injury.	Total number of accidents.
	Number of accidents.	Number of persons.			
		Killed.	Injured.		
EXPLOSIVES.					
Dynamite ... ..	7	3	14	.....	7
Gunpowder ... ..	9	8	10	.....	9
Fireworks ... ..	11	12	18	1	12
TOTAL ... ..	27	23	42	1	28
CHEMICALS.					
Ammonia ... ..	1	1	...	.....	1
Chlorate of potash ... ..	...	...	...	1	1
Nitric acid ... ..	...	...	...	1	1
Sulphuric acid ... ..	1	...	1	.....	1
TOTAL ... ..	2	1	1	2	4
PETROLEUM.					
Crude oil ... ..	...	...	...	1	1
Kerosine ... ..	1	1	...	2	3
Oil fuel ... ..	1	17	3	.....	1
Oil ... ..	1	3	...	.....	1
TOTAL ... ..	3	21	3	3	6
GRAND TOTAL ... ..	32	45	46	6	38



## Appendix D.

*Statement showing the import of Explosives by Sea into British India from other countries in the year 1901.*

Quantity.				IMPORTS IN 1901.					
				Bengal.	Bombay.	Sind.	Madras.	Burma.	TOTAL.
Gunpowder, black,	...	lbs.		54,800	84,746	2,750	27,238	8,725	1,78,259
Gunpowder, smokeless	...	"		11,650	2,050	3,479	200	...	17,379
Dynamite	...	"		60,032	...	90,048	1,65,000	40,000	3,55,080
Blasting Gelatine	...	"		...	...	...	6,10,000	...	6,10,000
Gelignite or Gelatine Dynamite	...	"		...	...	...	61,950	...	61,950
Other Nitro-compound explosives	...	"		27,216	97,180	...	...	1,133	1,25,529
Detonators	...	No.		...	...	3,15,000	23,64,000	...	26,79,000
Fireworks	...	lbs.		...	6,93,034	1,10,405	26,555	3,274	8,33,268
Total	...	lbs.		1,53,698	8,77,010	2,06,682	8,90,943	53,132	21,81,465
Total	...	No.		...	...	3,15,000	23,64,000	...	26,79,000
VALUE IN RUPEES.									
Gunpowder, black,	...	Rs		44,827	36,669	2,460	11,803	8,270	1,04,029
Gunpowder, smokeless	...	"		32,255	4,065	10,907	665	...	47,892
Dynamite	...	"		75,000	...	1,00,165	1,31,765	33,235	3,40,165
Blasting Gelatine	...	"		...	...	...	6,50,330	...	6,50,330
Gelignite or Gelatine Dynamite	...	"		...	...	...	49,715	...	49,715
Other Nitro compound explosives	...	"		20,844	45,938	...	...	1,875	68,657
Detonators	...	"		11,012	...	6,69	51,893	...	69,274
Fireworks	...	"		10,707	1,76,425	37,784	8,434	1,230	2,34,580
Total	...	"		1,94,645	2,63,097	1,57,685	9,04,605	44,610	15,64,642



Appendix E.

No. 6296.

GOVERNMENT OF INDIA.

HOME DEPARTMENT.

---

PUBLIC.

---

*Calcutta, the 13th December 1901.*

NOTIFICATION.

IN exercise of the power conferred by section 7 of the Indian Explosives Act, 1884 (IV of 1884), the Governor General in Council is pleased to make the following rule in supersession of the rule published with Home Department Notification No. 660, dated the 23rd March 1899, and modified by Home Department Notification No. 888, dated the 27th March 1900, namely:—

*Rule.*

“The Chief Inspector or Inspector of Explosives with the Government of India may, subject to the provisions of the Indian Arms Act, 1878 (XI of 1878) and of any rule thereunder in cases to which that Act applies, in any part of British India,—

- (a) enter, inspect and examine any place, carriage or vessel in which an explosive is being manufactured, possessed, used, sold, transported or imported under a license granted under the Indian Explosives Act, 1884 (IV of 1884), or in which he has reason to believe that an explosive has been or is being manufactured, possessed, used, sold, transported or imported in contravention of that Act, or of the rules under that Act;
- (b) search for explosives therein;
- (c) take samples of any explosives found therein on payment of the value thereof; and
- (d) seize, detain, remove and, if necessary, destroy or otherwise render harmless any explosive found therein in respect of which he has reason to believe that the provisions of the said Act, or of the rules under that Act have been contravened:

Provided as follows:—

- (1) Whenever the said Chief Inspector or Inspector of Explosives seizes, detains or removes any such explosive he shall report the fact to the District Magistrate.
- (2) The said Chief Inspector or Inspector of Explosives shall not destroy or otherwise render harmless any such explosive without the previous sanction of the District Magistrate, unless the matter appears to him urgent and fraught with serious public danger; and in such cases he shall take and keep a sample of the explosive and shall, if required, give a portion of the sample to the person owning the explosive or having the same under his control at the time of seizure, and shall report the circumstances to the District Magistrate.”

J. P. HEWETT,

*Secretary to the Government of India.*



## Appendix F.

*General instructions drawn up by the Chief Inspector of Explosives, India, for the assistance of Magistrates making enquiries into cases of explosions and the chief points to be observed.*

1. A plan drawn to scale, should be submitted on which the site of the explosion should be marked by a red cross, and on which the buildings or other works in the neighbourhood should be shown.

2. Full information should be obtained as to the size and general construction of the building in which the explosion occurs, also details as to the number of rooms in it, the nature of the walls, roof and floor, and the kind of fittings in use whether of iron, copper, brass, etc. It should be stated whether a lightning conductor is attached to the building or not and some idea of the surroundings should be given such as the presence of trees, etc.

3. It should be stated under what rule the building is licensed and for what quantity and description of explosive and, also as far as possible, the amount and description of explosives stored at the time of explosion should be ascertained. In the case of fireworks, evidence as to their composition should be taken.

4. Evidence should be taken as to whether all the conditions on the back of the license were being carried out. Any infringement of the same should be brought to notice.

5. Evidence should be taken as to how the explosives were stored—

(a) Whether in one room irrespective of the different classes to which they may belong, or in several rooms.

(b) In what kind of receptacles or boxes and whether covered up and also in what kind of packages the explosives were packed and in what quantity.

(c) Whether any inflammable or dangerous substances were kept in the same building with the explosives or in the immediate neighbourhood.

6. Evidence should be taken as to what particular operations were being carried out at the time of the explosion and what vessels or tools were being used and as to whether only authorized persons were present at the time or engaged in such operation.

7. Evidence should be taken as to whether there was probability of the explosion having taken place through smoking, or the presence of any light or matches and also whether it might have occurred through the presence of any iron or steel or any foreign substance, such as soil. Grit is very likely to occur if natives go into any room where explosives are stored without washing their feet in a small wood tub of water before entering, or if Europeans enter without first putting on suitable overshoes.

8. The general lie of the debris that is in what direction projected and to what distance, should be stated, also information as to the time of the explosion, the nature of the weather at the time and any other points that the enquiring officer may think may be of use.

9. It should be stated whether the building has been regularly inspected by district officers and whether any steps were taken by them to check quantities or irregularities. The last date of inspection should be stated.





**Appendix J.**

No. 158.

GOVERNMENT OF INDIA.

HOME DEPARTMENT.

---

PUBLIC.

---

*Calcutta, the 15th January 1902.*

---

**NOTIFICATION.**

IN exercise of the power conferred by section 5 of the Indian Explosives Act, 1884 (IV of 1884), the Governor General in Council is pleased to direct that the following further rule be added to the proviso to Rule 2-III (e) of the rules to regulate the transport and importation of explosives, published with the like Notification No. 5528, dated the 11th October 1901, namely:—

"(iii) In the case of electric detonators, the quantity to be contained in any one such outer package may amount to not more than three thousand (3,000) electric detonators, or, if such outer package is provided with handles of such strength and construction as to allow it to be safely and conveniently carried by means of such handles, the number may be increased to five thousand (5,000)."

J. P. HEWETT,

*Secretary to the Government of India.*



Appendix K.

No. 1704.

GOVERNMENT OF INDIA.

HOME DEPARTMENT.

---

JUDICIAL.

---

*Calcutta, the 20th December 1901.*

---

NOTIFICATION.

THE following draft of a Notification, which it is proposed to issue in exercise of the powers conferred by section 8 of the Indian Petroleum Act, 1899 (VIII of 1899), is published for the information of all persons likely to be affected thereby, and notice is hereby given that the said draft will be taken into consideration by the Governor General in Council on or after the 1st February 1902.

2. Any objection or suggestion which may be received from any person with respect to the draft before the date aforesaid, will be considered by the Governor General in Council:—

DRAFT NOTIFICATION.

In exercise of the powers conferred by section 8 of the Indian Petroleum Act, 1899 (VIII of 1899), the Governor General in Council is pleased to make the following rule to regulate the transport of petroleum from one Province of British India to any other, namely:—

Where petroleum is transported from one Province of British India to any other, the rules relating to the granting of transport licenses and to the transport of petroleum for the time being in force in the Province from which the petroleum is transported, and no others shall, so far as they can be made applicable, be deemed to apply to the petroleum, so long as it remains in transport, as though it were being transported within the limits of such last-mentioned Province.

J. P. HEWETT,

*Secretary to the Government of India.*